

**A new freshwater snail from the Coosa River, Alabama
(Gastropoda: Prosobranchia: Hydrobiidae)**

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Abstract.—*Pyrgulopsis hershleri*, a new species, is described from the Coosa River, Alabama. It is closely related to three species from the Tennessee River system of northern Alabama. It is distinguished by characteristics of the shell and soft anatomy. The new species was incorrectly identified in earlier literature as *Amnicola olivacea* Pilsbry, 1895 (= *Pyrgulopsis olivacea*).

The hydrobiid genus *Pyrgulopsis* Call & Pilsbry, 1886 includes 66 described and many undescribed species of freshwater snails that are confined to temperate North America (Hershler 1994). Earlier Thompson (1977) reviewed eight eastern North American species under the genus name *Marstonia* Baker, 1926, which Hershler & Thompson (1987) later relegated to junior synonymy of *Pyrgulopsis*. The eastern species form a distinct clade within *Pyrgulopsis* distinguished by characteristics of apical whorl sculpture, operculum indentation, orientation of the terminal lobe on the penis, and aspects of the oviduct coil and the bursa copulatrix duct (Hershler 1994:81). Thompson (1977) noted the existence of an undescribed species in the Coosa River, Alabama, but the material available at the time was insufficient for taxonomic treatment. Recent field studies on the ecology of an endangered snail, *Tulotoma magnifica* (Conrad, 1838) provided the opportunity to collect other mollusks from a limited section of the Coosa River near Wetumpka, Alabama. The undescribed *Pyrgulopsis* was found to be common in this area. Its description is as follows.

Pyrgulopsis hershleri, new species

Vernacular name: Coosa Pyrg

Diagnosis.—A medium-sized species of *Pyrgulopsis* that is about 2.7–2.9 mm long

with an elongate-conical shell consisting of about 4.5 strongly arched whorls. The shell is thin and fragile, and lacks a noticeable callus within the aperture. The verge has a square-shaped oblique apical lobe, thereby relating it to a group of species recorded from the Tennessee River system in Alabama (Fig 1). This group includes *Pyrgulopsis argus* (Thompson, 1977), *P. ogmorhapha* (Thompson, 1977) and possibly *P. olivaceus* (Pilsbry, 1895). The new species is unique within this group by having a pigmented penis filament.

Shell (Figs. 2, 3A–C).—Shell thin, transparent when live; small, about 2.7–2.9 mm long (Table 1); light gray in color, surface glossy when fresh; elongate-conical in shape, 0.62–0.70 times as wide as long; spire slightly convex in outline, equal to or slightly longer than height of aperture, about 0.50–0.58 times length of the shell. Whorls 4.5–4.7; strongly arched but tending to be flattened along the periphery; suture deeply impressed; apical whorl 0.23–0.24 mm in diameter perpendicular to initial suture. Microsculpture on first half of the apical whorl coarsely pitted. Surface of shell smooth; microsculpture consisting of very fine irregular incremental striations and fine sparse spiral striations. Umbilicus narrowly perforate. Aperture slightly oblique, prosocline, lying at an angle of 16–20° to axis of shell in lateral profile; tending to be rhomboid in shape in



Fig. 1. The Coosa River at the type locality of *Pyrgulopsis hershleri*, new species.

most specimens, about 0.81–0.90 times as high as wide; posterior corner bluntly angulate; interior with a thin internal callus along outer and basal margin. Peristome complete across parietal wall; outer lip tending to be flattened compared to contour of earlier whorls; outer lip weakly arched forward in lateral profile. Measurements for the holotype and selected paratype are given in Table 1.

Operculum (Fig. 3D).—Broadly ovate in shape; upper columellar edge slightly in-

dentented; paucispiral, consisting of about 2.5 rapidly expanding whorls, nucleus subcentric. Attachment scar very thin and broad, about half the length of the operculum, extending through nucleus; ventral callus of scar weak or absent.

Male (Fig. 3E).—Base of penis compressed and nearly uniform in width. Penis with an enlarged oblique apical lobe that usually has a small terminal gland on its tip. Occasional specimens lack the terminal gland. Other glands are absent elsewhere on

Table 1.—*Pyrgulopsis hershleri*, new species. Measurements in mm based on 13 adult paratypes and the holotype. SL = standard length, SW = standard width, ApH = aperture height, ApW = aperture width, Wh = whorls.

	SL	SW	ApH	ApW	Wh	SW/SL	ApH/SL	ApW/ApL
\bar{X}	2.7	1.8	1.2	1.1	4.6	0.66	0.45	0.85
S ²	0.12	0.07	0.06	0.06	0.11	0.03	0.04	0.04
min.	2.5	1.7	1.1	0.9	4.5	0.61	0.42	0.79
max.	2.9	1.9	1.4	1.2	4.7	0.71	0.50	0.90
holotype	2.8	1.8	1.2	1.1	4.5	0.64	0.44	0.85

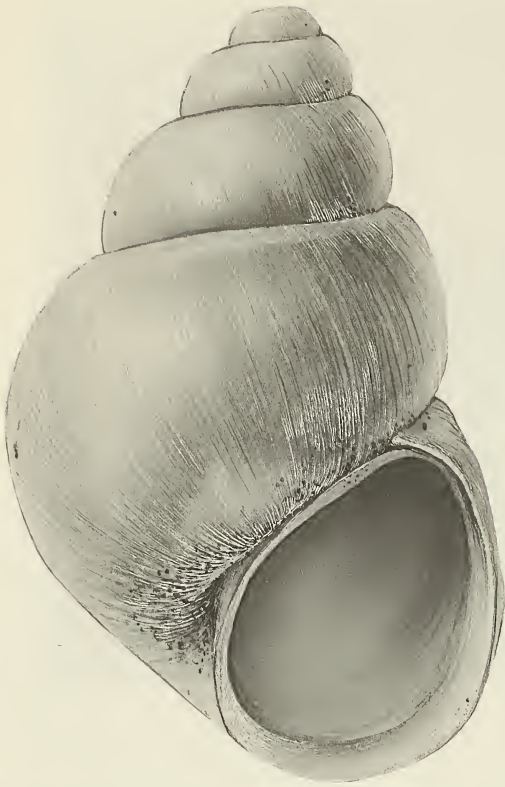


Fig. 2. *Pyrgulopsis hershleri*, new species. Holotype (UF 165788).

surface of penis. Penis filament moderately slender, extending beyond the apical lobe, densely pigmented with melanophores.

Type locality.—Alabama, Elmore County, Coosa River, braided island area above Moccasin Shoals, about 2.2 miles downstream from the Jordan Hydroelectric Dam; T 18 N, R 18 E. Holotype: UF 165788; collected July 24, 1990 by Fred G. Thompson and Malcolm Pierson. Paratype: UF 165789 (9), UF 174347 (30), USNM 860563 (8); UF 165790 (5 in alcohol), same data as the holotype. Corn Creek Shoals, ca 7.0 mi. NW of Wetumpka UF 230595 (22), UF 230735 (10).

The river at the type locality consists of numerous shoals and shallow intermittent pools overlying a substrata of granite-schist outcrops, boulders and gravel. The river is braided with small islands and rock reefs (Fig. 1). This section of the river fluctuates between shallow gentle flow and violent floods that occasionally rise as much as 35 feet above normal water level. Normally the river fluctuates by less than a meter on a daily cycle because of regulated discharge from the Jordan Hydroelectric Dam upstream, but heavy rains may raise the water level to torrential levels that can scour and reorganize the river bed. *Pyrgulopsis hershleri* was found only on rootlets of the bald cypress, *Taxodium disticum*, growing along the edges of quiet shallow pools. Other species of aquatic angiosperms, algae mats and various types of substrata were screened for specimens, but without success.

Distribution.—Specimens are available from two sections in the Coosa River. One lot (UMMZ 161894), contains two specimens from Etowah County, without more exact information. The second section from which specimens are known is the short segment of the river between Jordan Dam and Wetumpka. This portion of river contains numerous intermittent shoals distributed over a distance of about seven miles. This is virtually the only section of the Coosa River that remains in a nearly original state. The rest of the river above and below this section is highly modified by impoundments. The microhabitat from which *P. hershleri* was collected suggests that the species may be present in other sections of the river where there are bald cypress trees along the river edge. Available survey data is insufficient to address this question. Recommendations concerning the conservation status of the snail are not practical until a more intensive search is made elsewhere in the Coosa River. *Pyrgulopsis hershleri* is the only species of the genus known from the Alabama River system.

Remarks.—A popular misconception in

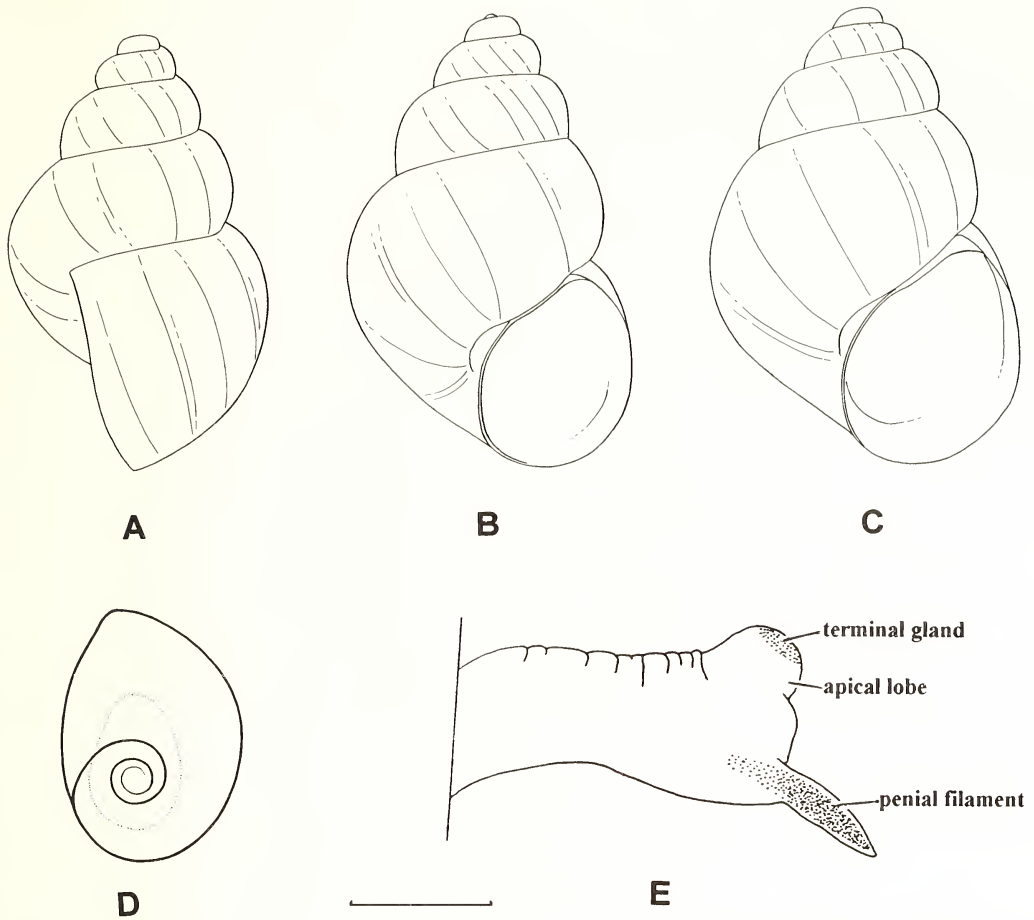


Fig. 3. *Pyrgulopsis hershleri*, new species. A, lateral view of holotype; B–C, paratypes; D, operculum; E, penis. Scale bar = 1 mm for Figs. A–D, 0.75 mm for Fig. E.

malacology is that the freshwater molluscan faunas of the Alabama River system and its principal tributary, the Coosa River, are well known. This misconception is based primarily on the numerous works by Calvin Goodrich who wrote extensively on the Pleuroceridae as well as other prosobranchs (e.g., 1936, 1941, 1944a, 1944b). His studies on the Pleuroceridae are marred by omission of data concerning distributions, taxonomy and the unresolved status of the numerous names that he placed in synonymies. His treatments of other families include many species that are suspect of misidentification. Indeed the systematic status

of virtually every species of gastropod recorded from the Coosa requires reexamination. This paper concerns one such species.

Goodrich (1944a:6–10) discussed various hydrobiid gastropods from the Coosa River system, including five species of *Amnicola*. Specimens of the first species, *Amnicola limosa* (Say, 1817) remain as Goodrich assigned them by virtue of the fact that the systematics of the *limosa* species-group are in critical need of review. A different assignment to species could not be made at present. Certainly they are a species of *Amnicola*. The names of two other species re-

corded by Goodrich, *A. sanctijohannis* Pilsbry, 1899 and *A. augustina* Pilsbry, 1904, are synonyms of *Cincinnatia floridana* (Frauenfeld, 1863), a species endemic to the Florida peninsula. The specimens upon which Goodrich based his records as well as those for "*A.*" *floridana* from the Coosa River have been shown to be incorrectly identified (Thompson 1968:123). Specimens of another species were identified by Goodrich as *Amnicola olivacea* Pilsbry, 1895 (= *Pyrgulopsis olivacea*), which until then was known only from a spring in the Tennessee River system at Huntsville, Alabama. Thompson (1977:123) showed that these also were misidentified. They represent the new species that is the subject of this paper.

Pyrgulopsis hershleri is a small, thin-shelled species with a simple conical shell that has 4.5 or fewer whorls. Its size, shell-shape and aperture-shape distinguish it from other eastern North American *Pyrgulopsis*. Anatomical features are rather monotonously similar among the eastern species compared to western congeners (Hershler 1994). Variation in penial morphology offers some useful comparisons. Penial morphology of *Pyrgulopsis hershleri* is most similar to that of two species from the Tennessee River system, *P. argus* (Thompson, 1977) and *P. ogmorhapha* (Thompson, 1977). These species are alike by having a well developed oblique apical lobe on the distal left margin of the penis. The right margin of the penis ends with a slender short penis filament. The lobe has a single small terminal apocrine gland. Other glands are absent on the lobe and penis. *Pyrgulopsis hershleri* differs from *P. argus* and *P. ogmorhapha* by having a pigmented penis filament. The filament is unmarked in the other two species. It differs further from these two species by its smaller size and thinner shell, as well as by shell shape. The adult shell of *Pyrgulopsis ogmorhapha* is about 4.0–5.1 mm long with about 5.2–5.8 whorls. It is elongate conical-terrete in shape, and it has a more broadly ovate aperture. Ju-

venile shells are thin and transparent as in *P. hershleri*, but the shell becomes slightly thicker in adults. Like *P. hershleri* the shell is relatively fragile, it does not develop a strong callus on the inner margin of the outer lip, and the outer lip is nearly straight when viewed in lateral profile. The adult shell of *Pyrgulopsis argus* is about 3.2–3.9 mm long with about 4.6–5.4 whorls. It is ovate-conical in shape with a narrow conical spire. The shell is thick and opaque, and the aperture has a heavy callus ridge along the outer lip. In addition the middle of the outer lip is strongly arched forward as viewed in lateral profile (Thompson, 1977: Fig. 1 B, Fig. 6 B). The shell of *P. hershleri* is similar in shape to that of *P. olivacea* (Pilsbry, 1895). *Pyrgulopsis olivacea* is a much larger species, being 3.9–4.5 mm long; it has 5.0–5.4 whorls, and the inner lip of the peristome is incomplete across the parietal margin. It remains unknown anatomically, and it may be extinct (Thompson 1977:122–124).

Etymology.—I take pleasure in naming this species after Robert Hershler in recognition of his numerous contributions to malacology.

Acknowledgments

This species was rediscovered during the course of an ecology study of the endangered viviparid snail, *Tulotoma magnifica*, a project sponsored by the Alabama Power Company (APC). Assistance in the field was provided by Malcolm Pierson (APC) and Steven P. Christman (Florida Museum of Natural History). The photograph of the Coosa River (Fig. 1) was provided by Malcolm Pierson (Alabama Power Company). The illustration comprising Fig. 2 was rendered by Barbara Harmon, Scientific Illustrator, Florida Museum of Natural History. I am grateful to Kurt Auffenberg and Elizabeth L. Raiser for assistance in the preparation of this paper.

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